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AUTHOR(S):

STILES, Daniel

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HUNTER-GATHERER STUDIES: THE IMPORTANCE OF CONTEXT

Daniel STILES
Nairobi, Kenya

ABSTRACT Anthropological and behavioral ecological studies of living hunter-gatherers have flourished since the 1960's. Researchers have developed and followed a variety of paradigms, each with its own assumptions and objectives, based on the behavior of hunter-gatherer communities. I argue here that in order to evaluate the validity of the use of a specific hunter-gatherer group for particular paradigmatic purposes, details of the historical and social context of the group are needed. The use of an inappropriate group, as determined by its context, can call into question the conclusions of a study.

A method for classifying hunter-gatherer groups according to progressive stages of historical contact and interrelations with agricultural neighbors is proposed. The use of this classification system can aid in analyzing and answering important questions concerning the hunter-gatherer adaptation: what explains immediate return and delayed return systems? Why do hunter-gatherers persist today? Can contemporary hunter-gatherers be used as valid models or analogues for prehistoric human behavior? The answers to these questions are related to the ultimate question: Why study hunter-gatherers?

Key Words: Hunter-gatherers; Classification; Context; Immediate return; Delayed return

INTRODUCTION

This paper will deal with four related topics: (1) Why study hunter-gatherers? (2) Why do some hunting-gathering groups practice immediate-return systems and others delayed-return? (3) Why do 'encapsulated' hunter-gatherers (h-gs) persist in the face of outside pressures for 'development' or assimilation? (4) Is it appropriate to use contemporary h-gs as models for prehistoric human behavior? In addition, to help address these questions a system for classifying h-g groups will be proposed, which can also be applied to evaluate a particular group's suitability for certain types of research.

WHY STUDY HUNTER-GATHERERS?

There are widely disparate views on this question, judging from the sometimes acrimonious debate found in the literature. Currently the reasons for studying h-gs can be assigned to three main paradigms:

I. Traditional Social Science

The principal reason is to broaden our knowledge and understanding of different peoples and address selected theoretical issues.

a) ethnography - This type of study was historically the first. The studies are generally descriptive, particularistic, concerned with the traditional sociocultural and economic system, and stress the functional, structural, or ecological aspects of a h-g society, depending on the theoretical orientation of the researcher(s). This type of study began in the late 19th century (Bailey,1863; Dawson, 1881; Fison & Howitt,1880; Man, 1883; Spencer & Gillen, 1899) and has continued with increasing sophistication (e.g., Barnard, 1992; Berndt & Berndt, 1954; Damas, 1963; Drucker, 1955; Dunn, 1975; Hewlett, 1991; Hiatt, 1965; Kroeber, 1925; Marshall, 1976; Radcliff-Brown, 1933; Silberbauer, 1981; Steward, 1938; Turnbull, 1965; Watanabe, 1968; Woodburn, 1964). Related to 2(a) below, many studies since the 1980's investigate selected socio-economic features that are thought to be characteristic of h-g societies (Bird-David, 1992; Cashdan, 1980; 1983; 1985; Hart & Hart, 1986; Ingold et al., 1988a and b; Kent, 1993; Leacock & Lee, 1982; Woodburn, 1982; 1988).

b) culture change - These studies focus on the transformations that have taken place in h-g societies since contact with outside groups (e.g., Bahuchet & Guillaume, 1982; Bichieri, 1972; Eder, 1987; Graburn, 1969; Griffen & Estioko-Griffen, 1985; Guenther, 1979; Headland, 1986; Hitchcock, 1987; Hitchcock & Holm, 1993; Kent, 1989; Osaki, 1990; Tanaka, 1987; Turnbull, 1983). They raise political and socioeconomic issues facing h-gs in the contemporary world, and describe how h-g cultures are adapting to change.

c) history - Purely historical studies of h-g groups are few, and they are closely related to types 1(a) and (b). They usually include histories of neighboring peoples as well. Because of the dearth of written historical records relating to h-gs, archaeological evidence, ethnolinguistics, comparative ethnography and oral traditions become important sources (Bahuchet & Guillaume, 1986; Berndt & Berndt, 1954; Blackburn, 1974; Crowe, 1974; Elphick, 1977; Smith, 1997a; Stiles, 1981). These studies commonly include the prehistoric period, but are distinguished from other ethnoarchaeological research of the more recent periods by their objectives (see 2(b) below).

II. Analogies with the Past

Prehistorians have made analogies between archaeological materials and living h-gs since the beginnings of prehistoric archaeology (de Jussieu, 1723; Lubbock, 1865; Sollas, 1911), but in the 1950's and 1960's two new subdisciplines of anthropology emerged with more analytic theoretical approaches to interpreting and explaining past human behavior using living h-gs as models. Both subdisciplines assume the principle of uniformity (Lee, 1979: 434).

(a) human sociobiology - The term sociobiology has fallen out of favor and the paradigm is more commonly referred to now as 'human evolutionary ecology,'

though other terms are applied as well (Cronk, 1991). Evolutionary ecology (EE) is based on the neo-Darwinian principle that the behavior of organisms within a given species is determined by natural selection acting on the species over its evolutionary history. Beginning with ethological studies of non-human animals it has extended itself through primates to humans (DeVore, 1965; Eibl-Eibesfeldt, 1975; Lee & Devore, 1968; Lorenz, 1958; Tiger & Fox, 1966; Wilson, 1975). Since humans have spent the vast majority of their evolutionary history as h-gs, EE assumes that h-g behavior today can inform us about human behavioral evolution. The EE of the 1960's and early 1970's (Lee & Devore, 1976; Lee, 1979) could be viewed as transitional between the functionalism as seen in cultural ecology and the strictly 'adaptationist' paradigm of later EE. Today's EE h-gs are expected to behave in ways that maximize biological fitness, and most EE studies use methods that fall broadly under optimal foraging theory (Smith, 1983; 1991; Hawkes, 1993; Hawkes et al., 1982; 1985; Hill et al., 1984; 1987; Winterhalder & Smith, 1992). EE considers the history and culture of a group to be of little relevance to the objectives of their research. A necessity, however, is that the h-g group under study be practicing as near enough as possible a traditional h-g subsistence system, little affected by outside influences. The aim is to explain current behavior in evolutionary terms.

(b) ethnoarchaeology - Defined as encompassing all of the theoretical and methodological aspects involved in comparing ethnographic and archaeological data, including the use of the ethnographic analogy and doing archaeological ethnography (Stiles, 1977). Many studies involving h-gs have been carried out, with an emphasis on subsistence and settlement pattern material remains (Binford, 1978; Bunn et al., 1988; Gould, 1968; Hudson, 1993; Kent, 1984; Kroll & Price, 1991; O'Connell et al., 1990; Peterson, 1973; Schrire, 1972; Yellen, 1977). The main objective is to explain past human behavior as reflected in the archaeological record by analogy to similar behavior with living h-gs.

III. Revisionist

These studies, which can also make use of archaeology, aim to invalidate any notions that h-g groups have been isolated and unaffected by a history of contact with agricultural (including pastoralist) peoples. They posit that modern h-g peoples are only part of larger socio-economic systems, that h-g are economically opportunistic and have usually undertaken agriculture and trade with agriculturalists at some time in their history, and that because of outside influences most or all do not represent valid analogies with pre-agricultural h-gs (Headland & Reid, 1989; Hoffman, 1984; Kent, 1992; Lewin, 1988; Parkington, 1984; Peterson, 1978; Schrire, 1980; Stiles, 1992; Wilmsen & Denbow, 1990). Some of these studies view h-gs as an exploited underclass, and that many of the social features that are thought to epitomize 'real' h-gs, such as egalitarianism and general reciprocity, are in fact artifacts of subjugation (Gordon, 1992; Wilmsen, 1989). One aim of these studies is to reveal a more realistic view of h-gs so that more is not made of their way of life in making analogies than is justified.

CLASSIFICATION OF HUNTER-GATHERER GROUPS

I. Explanation and Context

Explanation involves finding the independent variables that cause a certain outcome, the dependent variable(s). In this discussion the independent variables are the historical, ecological and social context of the h-g group in question. The dependent variables will be the type and characteristics of the h-g subsistence economy practiced, in this case immediate-return (IR) or delayed-return (DR).

Since the independent, or causative, variables are made up of contextual phenomena in which a h-g group finds itself, and these vary considerably from group to group, it seems reasonable to conclude that not all groups should be considered as belonging to one homogeneous whole for explanatory purposes. There may be different reasons why some groups display the IR or DR features they do. The independent variables were therefore 'controlled' by classifying them for each h-g group primarily by historical stages of contact and interrelationship with neighboring agricultural peoples (including pastoralists). Once a group can be classed to a stage, the contextual variables that explain the IR or DR system can be identified with greater clarity and higher probability.

II. Contextual Classification System

Each stage is defined primarily using criteria describing the interrelationship that exists or existed between a h-g group and one or more agricultural (ag) groups [(1)]. These relationships evolved or fluctuated through time in the group's history, thus any one group could be classified differently according to any defined time period.

Stage 0: Precontact - 'Precontact' is usually understood to refer to contact with Western society, but in this case it pertains also to contact with local ag peoples. It is unlikely that any full h-gs in the 20th century have been completely isolated from outside, non-hunter influences, and it is debatable whether any modern study can claim to have worked with h-gs who were practicing a precontact h-g system, though claims have been made to that effect (Brosius, 1990: 7; Hawkes et al., 1984: 115-116; Hill & Kaplan, 1990: 1; Holmberg, 1950; Lee, 1979; Nance, 1975). Stage 0 living h-g systems will obviously be most representative of prehistoric socioeconomic systems, at least of modern Homo sapiens. It is difficult to generalize about the features of these systems, as early descriptions were either not made by anthropologists or, if they were, consisted of postcontact reconstructions. It appears that there were significant variations in the degrees of egalitarian norms, sharing, territoriality, mobility, settlement patterns, group sizes, kinship systems, social organization and so on, and there is much disagreement in the literature about the accuracy of early cultural reconstructions (see Lee & DeVore, 1968 for a small sample of these problems).

Examples would be hinterland Australian Aborigines, some North and South American groups and the Andaman Island h-gs before the mid-19th century, though

many of these would have had long-distance trade links with ag outsiders. It is unlikely any African h-g group was completely isolated from other African ags for at least the past 300 to 500 years, though contact could have been very limited in water deficit areas.

Stage 1: Contact. Historical first contacts between encroaching ags into h-g territory have often been marked by open hostility, or at least mistrust and unfriendliness (Blackburn, 1982; Elphick, 1977; Furlong, 1917; Radcliffe-Brown, 1933). Stage 1 h-g systems are still traditional at the time of contact, but they can change very rapidly, depending upon the intensity of interaction with the newcomers.

The Hadzabe of Tanzania are still in stage 1 with reference to the Datoga pastoralists, who are recent arrivals into Hadza land, and professional non-African hunters, though most are stage 2 with cultivating neighbors (Stiles, 1995). The Jarawa and Sentelinese of the Andamans only recently passed from stage 1 to 2 (Pandit & Sarkar, 1994). Coastal Australian Aborigines, Tasmanians, and most Native Americans were stage 1 with respect to European settlers up to the early 19th century.

Stage 2: Sporadic exchange. H-g commonly move quickly to establish more friendly relations with encroaching newcomers whom they perceive to be more powerful. They also learn that the ags have highly desired items which they lack - examples are iron implements, pottery, cloth, beads, tobacco and tea ($> \sim$17th century) and grain. Desire for these items attracts h-gs to ag settlements. Exchanging goods is usually the starting point, sometimes by the silent barter method. The h-g system is still relatively integrated, the people maintain their original language, and territorial integrity still exists, though settlement patterns can be altered and conflict with the ags can continue.

Most Nyae Nyae and Dobe Ju/'hoansi up to the 1950's and possibly early 1960's were at this stage, as were the Hadzabe, most late 19th century Australian Aborigines, all but eastern Native American h-gs up to about the late 19th century, the Sentinalese and some Mikea (Stiles, 1991) today, and I believe some southern Thailand Negrito bands still are, though their territories are much reduced (personal observation, 1993). Although greatly debated, the Tasaday were probably at this stage before 1971 and their 'discovery' (Headland, 1992). Descriptions of the Soaqua (Bushmen) in South Africa in the 17th-19th centuries with some Khoekhoe and Dutch seem to fall in this stage (Elphick, 1977), as well as some pre-European contact Aborigines with Macassans in Arnhem Land (Berndt & Berndt, 1954; Macknight, 1972).

Stage 3: Accommodation. Exchange relationships begin to regularize and intensify as trust and mutual understanding are built up over time. The outsiders establish their power superiority, and the h-gs begin to learn the ag language and superficially adopt some of their customs, dress and ornamentation to facilitate friendly relations. The h-gs can now usually visit ag settlements without fear and aggression is rare, though h-gs prefer to initiate any contact. Ags may take wives

or concubines from the h-gs. The ags begin to make more use of the h-g natural resources, putting pressure on the traditional system, which accelerates the process of system adaptation to the ags, but the h-gs maintain a territory. The h-gs and ag peoples begin to define each other in oppositional terms, forming the basis of an ideological differentiation, with the h-gs defined by the ags as being associated with the 'wild,' the 'forest,' and as such justifiably subservient to the ags. Individual h-gs commonly strive to establish some form of fictive kinship bond with individual ags, such as father-son or older brother-younger brother, with the h-g holding the inferior relationship, to formalize the patron-client association. This type of relationship was probably common in pre-European contact Africa and Asia, where h-gs were primary producers of wild forest products that entered both local and international trade networks (Dunn, 1975; Fox, 1969; Hoffman, 1984; Headland & Reid, 1989; Morris, 1982; Stiles, 1993a; 1994a). Regular h-g camps near ag settlements appear. Many h-g groups begin to experiment with cultivation and livestock [(2)].

Examples of stage 3 at the time of their description are the Aweer and eastern Wata and Degere of Kenya (Stiles, 1981; Walsh, 1990), the Basarwa of central and eastern Kalahari (Hitchcock, 1987; Silberbauer, 1981; Tanaka, 1980; Vierich, 1982), some Soaqua of South Africa with a few Khoekhoe groups (Barnard, 1992; Elphick, 1977), various Negrito or mixed-Negrito groups of Southeast Asia (Dunn, 1975; Eder, 1987; Endicott, 1988; Griffen & Estioko-Griffen, 1985; Headland & Reid, 1989; Rambo, 1988; Schebesta, 1927), the Mlabri of Thailand and Laos (Bernatzik, 1958; Pookajorn, 1992; Trier, 1981), the Tau' Batu of the Philippines (Peralta, 1979), Inuit up to about 1960 (Crowe, 1974; Graburn, 1969), the Ainu to 1884 (Watanabe, 1968), and the Ache (Clastres, 1972) and Maku (Milton, 1984) of South America up to about 1970.

Stage 4: Acculturation - The position of the h-g group becomes ideologically and socio-economically structured vis-á-vis the ag peoples. The h-gs become a low status, even low caste, people and are considered by many ags to be ritually impure, though, paradoxically, they can play important roles in many ag ceremonies such as circumcisions or blessings of various sorts. The h-gs often adopt the language and many cultural features of the ags, and they perform various kinds of low status services. If the land and resources remain, trading of natural and crafts products becomes a principal occupation, and as a consequence h-g generalized reciprocity (sharing) and egalitarian ideals and behavior are weakened, and the nuclear family becomes the primary economic unit for trade products. In this case the h-gs maintain some home territory, and a situation called 'bicultural oscillation' (Gardner, 1985) ensues in which the h-gs behave in a way acceptable to the ags when interacting with them on their territory, and revert to the traditional life when in the forest/bush. If the land and resources are too impoverished or unavailable for other reasons for trade in natural products, the h-gs usually work sporadically for the ags as crop-tenders, herders, watchmen, or soldiers, and may take up agriculture themselves, though foraging will continue. The h-gs become more sedentary, for at least part of the annual cycle, and food storage may be practiced. Certain males may emerge as quasi-leaders.

Some examples are the various Pygmy groups of both Congos, the Central African Republic and the Cameroons (Bahuchet & Guillaume, 1982; Bailey & Peacock, 1988; Harako, 1976; Hart & Hart, 1986; Turnbull, 1965), some San groups (Biesele et al., 1989; Guenther, 1979), the Midgan of Somalia (Kirk, 1904), northern Kenya Wata (Kassam, 1986; Stiles, 1993b), Kenyan Okiek and other Dorobo groups (Blackburn, 1982; Kratz, 1979; Stiles, 1993b), some Mikea of Madagascar (Stiles, 1991), most Indian foragers (Fox, 1969; Gardner, 1966; 1985; Lal, 1979; 1986; Misra, 1990; Morris, 1982; Murty, 1992; Naik, 1956), and a few Native American (Crowe, 1974; Murphy & Stewart, 1956) and Australian Aborigine groups (Pilling, 1968). The Wata and various Dorobo groups of Kenya and Tanzania are examples of h-gs who were in stage 4 long enough to experience a complete language shift, losing their original language (Heine, 1979; Winter, 1979).

Stage 5: Assimilation/Annihilation - If stage 3 or 4 falls out of equilibrium, or were never attained, the last stage signals the imminent demise of the h-g group as a distinct ethnic entity. The socio-economic system is in tatters, alcoholism often causes severe social problems, population growth is negative, internal aggression increases, relations with the dominant ag community are antagonistic, and foraging ceases to be of economic importance. Principal subsistence is frequently provided by government or missionary organizations. Groups can linger on for some time in this stage, as they are often settled on missions or reserves, but some groups have moved from stage 1 to the termination of 5 within a century, bypassing some or all of the intervening stages. Infamous examples are the Tasmanians, South African Cape San, and the Terra del Fuego Indians.

Groups that seem to be in various phases of this stage are some San in Botswana and Namibia (Biesele et al., 1989; Marshall & Ritchie, 1984), the Batak (Eder, 1987) and Agta (Headland, 1984: 30) of the Philippines, the Onge of Little Andaman Island (Pandit & Sarkar, 1994), and some Australian and American groups, in particular the Ache of Paraguay (Anon., 1984; Munzel, 1973). The status of the Ache is of notable interest in light of their extensive use as models for human behavioral evolution and the testing of hypotheses of optimal foraging theory (Hawkes et al., 1982; Hill et al., 1984; 1987). Researchers of the EE paradigm have presented the Ache as practicing stage 0 foraging behavior. Which stage are they?

It is sometimes problematic classifying an ethnic entity or cultural group as a whole to one stage, as there are cases in which individuals or bands of the same group decide to live either as foragers (stage 1-3) or with the ags (stage 4-5), and there is usually some movement between the two. Examples are the Ju/'hoansi (Lee, 1979: 56), Southern Kalahari Basarwa (Vierich, 1982), Hadzabe (Woodburn, 1968: 49), and Mikea (Stiles, 1994b: 31). The Hadzabe-Isanzu of Tanzania and Mikea-Masikoro of Madagascar seem, in fact, to be similar in many ways.

H-g groups can also be classified as practicing either an IR or a DR system to complement the historical stage classification. Thus the Aweer today could be classed as being DR, 3 - a delayed return group at an Accommodation stage with neighboring ag peoples. Up to the early 20th century, however, they were an IR, 4 group, being acculturated by pastoralist neighbors. There are still many cultural vestiges of the close link to their former Warday-Orma neighbors, who no longer live in the area (Stiles, 1988). But what explains shifts from IR to DR?

EXPLANATION OF IR AND DR SYSTEMS

I. Definitions

Woodburn (1982; 1988) defined the IR and DR systems based on a dichotomy long seen in the h-g ethnographic record between highly mobile, 'free,' subsistence h-gs and more sedentary, 'dependent,' mixed-economy foragers encapsulated by ag neighbors. Huntingford (1931) called the former 'free hunters' and the latter 'serf-tribes' in East Africa and Hoffman (1984) calls them 'primary' and 'secondary' h-gs for the Asia-Pacific region. Braidwood (1960), Binford (1978), Hayden (1990) and others have also dichotomized h-gs into two types: (1) foragers, unspecialized food-collectors, or generalized h-gs and (2) collectors, specialized h-gs or complex h-gs respectively. Testart (1982; 1985) has produced the most complete model involving both ecological and socioeconomic features, and the model here builds on some of his ideas. Woodburn has included variables found in all in defining IR and DR. Woodburn's definitions, constituting the dependent variables, can be divided into six categories. Where his definitions were not complete or ambiguous I have taken the liberty of making my own revisions and additions.

1. Subsistence technology
   IR- (a) There is a direct and immediate return on labor, (b) food is not elaborately processed or stored, and (c) implements are simple and made with little investment.
   DR- (a) Wild products (e.g.. reindeer, sago palms) may be tended, (b) food is processed and stored, and (c) there are substantial food-gathering and storage facilities such as boats, weirs, beehives, and store-houses.
2. Settlement patterns
   IR- (a) Social groupings are flexible and fluctuating and (b) there are no fixed dwellings, camps, stores, ritual sites and so on.
   DR- (a) Social groupings are flexible and fluctuating, but extended families are more cohesive and cooperative than in IR, (b) there are durable structures, and (c) settlements tend to move less often than in IR and there are periods of fixed residence.
3. Social organization
   IR- (a) Strictly egalitarian, (b) no institutions for enforcing social norms, (c) social rules are simple and flexible, and (d) the lineage is the highest order kinship arrangement.
   DR- (a) Leadership roles exist (hunt leaders, 'headmen'), (b) a council of elders or headman deals with social disputes and rule-breakers, (c) social rules are structured and complex in order to regulate labor, distribution of production, and marriage, and (d) higher order kinship arrangements such as clans, phratries and/or moieties are present.
4. Social obligations
   IR- (a) Commitments with people are short-term, (b) no one is dependent on any specific other person for access to basic needs, and (c) individuals can choose with whom they associate in residence, foraging, exchange and ritual.
   DR- (a) People have binding commitments and dependencies through which goods and services are transmitted.

5. Property and sharing
   IR- (a) Sharing is of the general reciprocity type and (b) there are sanctions against accumulating personal possessions.
   DR- (a) People hold rights over their facilities, stored foods and tended wild products, and (b) males hold rights over women for marriage to other men. (c) Sharing networks are smaller than in IR and are more the balanced reciprocity type.
6. Territoriality
   IR- (a) There are named territories but (b) access is free and open to resources for anyone. (c) It is assumed there will be no territory or resource defense, though Woodburn did not specify.
   DR- (a) Territories have recognized boundaries and user groups, though in general access is open to known others, (b) certain resources have recognized 'owners,' and (c) these resources could be defended.

II. An Explanatory Model of IR and DR Systems

With the revised definitions, I think it possible to propose an explanatory model consisting of several testable propositions. With stage 0 h-gs, it is the ecology and technology that are the ultimate causes of a subsistence system being IR or DR.

1. *Immediate return*

Proposition 1 - (a) The ecology demonstrates weak seasonality, no extended periods of severe food scarcity or abundance, (b) resources tend to be K-selected species, and (c) subsistence resources are species-numerous, highly variable and scattered. (d) Single source abundances (i.e. large mammal kill, tree grove fruiting) are ephemeral and the timing largely unpredictable, but the probability is high that on any given day enough food will be obtained.

Proposition 2 - The ecology and resource distribution in time and space cause a highly mobile settlement pattern of relatively small (<50 people) groups.

Proposition 3 - (a) High mobility, (b) ephemeral, scattered resources, and (c) the high probability of finding some type of food daily causes the tool kit to be light and portable and elaborate food processing and storage to be unnecessary.

Proposition 4 - (a) Not every household will consistently produce daily the food necessary for survival for various reasons: illness, social obligations, ritual reasons, bad luck or skill in hunting, etc. (b) It is in every individual's interest to share out surplus food to food-deficit individuals, with the expectation that the act will be reciprocated when they find themselves in similar straits (variance reduction). (c) Virtually every person in the camp will be a consanguine, affine or classificatory kin, thus social values for family support will bolster a sharing ethic. (d) Almost every person in the regional group will be known to every other person, as kin ties are widespread and residence in camps fluctuate often, thus expectations of general reciprocity are high, facilitating tolerated theft.

Proposition 5 - There will be interpersonal conflict. There will be differences of opinion on where to move the camp next, and the camp will split. These conflicts and opinion differences cause camp composition to fluctuate highly.

Proposition 6 - (a) Because of the sharing ethic, and because investment costs in food and personal items in relation to expected benefits for sharing are low, there is low motivation for holding or defending private property. (b) This creates expectations that property is freely transferable. (c) Since holding private assets is not possible, any trade or exchange with others will be small scale and for immediate consumption/use with no profit motivation. (d) Since no asset is private, there is no incentive for an individual to store food when it is in excess. (e) Since camp composition fluctuates and moves often, there is no incentive for a camp to store food.

Proposition 7 - (a) Since everyone is conceived as being kin, since camp residence is constantly fluctuating, and since obtaining food requires minimal cooperation, no adult individual needs to make long-term commitments or dependencies with other specific individuals. (b) For the same reasons, it is more cost-effective to change camp residence than to set up some institution for conflict resolution.

Proposition 8 - Since labor needs are low, group organization for specific purposes unnecessary, and marriages are easily arranged between lineages, there is no function for higher forms of social arrangements such as clans or moieties.

Proposition 9 - Since interpersonal conflicts are resolved by persons involved changing camp residence, since decisions affecting subsistence and settlement are made at the household level, and since no adult depends on any other specific person, there are no functions for leaders. Any person attempting to make decisions for others or to take a larger share of resources would soon find himself in a camp of one household.

Proposition 10 - (a) The group territory and its resources will be open to anyone in the group sensu lato (i.e. the constituents of all of the camps) because they are all kin ideologically. (b) Low population density in relation to resources also promotes communal resource use. People outside of the group will not enjoy such rights, but reaction to incursions will depend on many factors and cannot be predicted simply by IR system variables, thus the question falls outside the purview of this discussion.

Proposition 11 - IR groups will have relatively unstructured social rule systems because of the simple, flexible economic system.

2. *Delayed return*

Proposition 1 - (a) The ecology demonstrates marked seasonality in scarcity and abundance of resources, (b) important foods tend to be periodically abundant r-selected species, and (c) there is a smaller range of exploited resources and usually only one or two abundant resources at any one time. (d) There is a lower probability that new food will be found on any given day than in IR.

Proposition 2 - (a) Periods of resource abundance cause long-term settlement if the resource location is stable. (b) Resource abundance causes larger settlement size than in IR and (c) in conjunction with the occurrence of periods of scarcity, large amounts of food are processed and stored. (d) Highly seasonal ecosystems commonly carry migratory game species which result in mobile h-g settlement patterns during the migration season. DR systems are thus often characterized by a season of fixed settlement and a season of mobility.

Proposition 3 - Long-term habitation and storage needs cause durable structures to be built.

Proposition 4 - Organized group labor is needed periodically for constructing and utilizing facilities and for obtaining the abundant resources. This need causes some form of institutionalized leadership to be created to manage labor.

Proposition 5 - (a) Need for labor cooperators creates commitments and dependencies on specific others, (b) these others tend to be kin, (c) the cooperative labor produces abundant food and this has to be distributed and stored, (d) kinship relations often regulate the distribution and ownership of the facilities that created the food and the food itself, and (e) the leaders from (4) above are instrumental in implementing this function.

Proposition 6 - The existence of facilities and stored food which require high investment costs causes the investing individuals to be motivated to ensure they receive the benefits. This tends to result in balanced reciprocation in which the cooperators are included in the sharing network and non-cooperators are excluded. Expectations of reciprocation from sharing with non-producer, non-kin group are low, unless a specific arrangement is made. The 'sharing' of these latter arrangements might better be described by the term 'exchange.'

Proposition 7 - People are forced by subsistence circumstances to dwell together for extended periods, thus conflict cannot usually be resolved by residence change as with IR. Some form of conflict resolution is needed. The labor managers and food distributors of (4) and (5) will usually fulfill this role.

Proposition 8 - Periodic abundant resources produce surplus food and byproducts (skins, furs, sea mammal oil, shells and teeth, etc.). The surplus products are available for external trade, and ownership is restricted in general to the producer group. Traded items are privately owned by the producer group, and the received goods can be traded again to an internal sub-group or to an external group. This creates private profits.

Proposition 9 - (a) Since there is surplus food for part of the year and stored food for much of the rest, there is reduced need for generalized sharing (variance reduction), and (b) 'theft' as a type of sharing will only be tolerated within the producer group, it will be condemned between non-kin, non-producer group individuals.

Proposition 10 - Surplus food, processing byproducts and trade profits represent wealth. This wealth belongs to the producer group but is controlled by the leaders. Accumulated wealth creates benefits, not the least of which is avoiding starvation during hard times, and producer group members strive for these benefits. Since there are several producer groups in any community, competition results, which leads to differential increased striving and accumulation. The headmen enter into social competition with other headmen to enhance their ability to attract more producers to the producer group, or to make alliances that will enhance competitive success. Differential wealth transforms to inequalities in power, and social hierarchies result.

Proposition 11 - The dynamics of competing producer groups, periods of surplus food, and the need for ever more producers causes the socially competing leaders to strive to obtain additional females for themselves and other sub-group members as both labor and reproducers of labor. Females can thus come to be controlled as an

asset. All these factors cause population to grow. This will increase the frequency of reaching Liebig's law of the minimum, and will stimulate cultural responses to limiting population growth.

Proposition 12 - There can be more than one abundant resource available simultaneously, which results in individuals or households choosing which to exploit. Recurrent same-choice selections results in occupational specialization, and if the returns of one occupation are significantly greater than the other, occupations come to be associated with differential wealth and power, and thus status. This can become institutionalized, creating occupational hierarchies.

Proposition 13 - The high investment costs of constructing and maintaining facilities, of organizing labor, and of gathering and storing food, along with the value of accumulated wealth, create a high incentive for DR system groups to defend their territories, or at least the most valued resources.

Proposition 14 - DR societies will manifest more complex and structured social rule systems than IR in order to manage the more complex economic system.

Proposition 15 - Transition from IR to DR in a world of h-gs is predicated on the acquisition of new technologies that permit moving into highly seasonal resource habitats.

In general, one can make the following statements concerning significant features of IR and DR systems:

1. Ideal and practiced egalitarianism and generalized reciprocity can only exist with an IR system, they are not possible with a DR system.
2. An IR system will exist, in the absence of ag contact, when household food variance is high, but group food variance is low.
3. When group food variance is high, a DR system involving intensified food collection during times of abundance and food processing and storage are necessary in order to survive the periods of food scarcity.
4. Periods of sedentism and facilities are commonly associated with the DR system to enable the necessary food acquisition and storage to be carried out.
5. IR is an evolutionary stable strategy in the absence of environmental or social factors causing adaptation to DR. The social factors will usually be external, but under certain circumstances might be internal.
6. A DR h-g system will lead to sedentism, population growth, increased socio-economic system complexity, and social hierarchies. DR systems are not evolutionarily stable.

III. Discussion

The propositions are testable by reference to existing or new research. Some may appear to be obvious facts or simple statements, but each proposition has already generated dozens, sometimes hundreds, of papers and books discussing their ramifications in other contexts [3]. Here, each must be associated with either an IR or DR h-g system existing in a world of h-gs. The propositions are meant to explain only the gross IR/DR features, there are many variations within each seen in specific groups that are not explained by ecology or technology.

I would suggest that the anomalies we see in existing h-g groups, in which IR and DR criteria are mixed, are due largely to varying degrees of contact between h-g groups and ags as represented in stages 1-5. There seem to be two ways in which relations with ags cause shifts in h-g societies from IR to DR variables: (1) The subsistence and egalitarian ethics remain ideally IR, but intensified trade causes sharing networks to shrink to the producer group, usually the nuclear family. In accordance with DR proposition 6, Murphy and Steward (1956), Blackburn (1982), and Gardner (1985) present examples of this. (2) H-gs may begin to take up agriculture, either because of ag degradation and/or reduction of the h-g resource base or as a method of seeking cultural acceptance by the ags, and this leads to increased sedentism, the use of facilities and storage, and many of the other dependent variables hypothesized for DR above. Vierich (1982), Hitchcock (1987) and Eder (1987) give examples of this.

Internal dynamics might also lead a stage 0, IR group to transform to DR. A good example may be some Australian Aborigine groups which might have represented incipient DR at the time of contact. The subsistence system was basically IR, but food gathering intensification and increased labor needs had already stimulated weak leadership roles, nascent social competition, and the control of females (Lourandos, 1985). Food gathering intensification might have been the result of population exceeding the resource base, or possibly the h-gs learning to exploit a r-selected resource in a rich environment.

An IR system can also be prevented from shifting to DR. This can come about when the IR h-gs live in an area of territorial insecurity, with hostile h-g or ag neighbors. There is no incentive to invest in facilities and/or long-term storage if there is a high probability that outsider neighbors will plunder the fruits of labor. This case is found most often with stage 3-4 h-gs, but it could occur even with stage 0. It might help explain long periods of cultural stasis, even during changing environments.

DR cannot transform to long-term IR in highly seasonal ecosystems, as the h-gs could not survive unassisted without stored food and the facilities and sedentism that this implies. If there are stage 3-4, DR h-gs in weak-seasonal ecosystems, they should only take on IR features in response to some disaster, such as drought, famine or enemy attack, or if they are forced to be IR by ag domination (Woodburn, 1988: 58). There should be no stage 0-2, DR h-gs in these ecosystems, according to the model above.

HUNTER-GATHERER PERSISTENCE

All h-g groups today would have to be termed 'encapsulated,' depending to some degree on neighboring ag groups for subsistence, or being integrated into the modern market economy. Why do they persist? Is it simply isolation, the backwardness of the people, and inertia? This viewpoint sees 20th (soon 21st) century h-gs as merely anachronisms, in need of development and modernization. The h-g mode of subsistence is seen as having no value or purpose, which is argued by government and business interests to further their own aims, which usually involves expropriating the h-g territory.

In view of centuries long h-g periods of coexistence with ags, there must be more than backwardness and inertia to explain their persistence. I believe mutualistic specialization and resource partitioning explain subsistence/trading stage 3 and 4 h-g groups, reinforced by ideological differentiation. Stages 3-4 not only have a long history and current presence, but they have a future, albeit precarious.

Mutualistic specialization refers to a situation in which two neighboring groups arrive at an arrangement whereby each group provides the other with goods and services not available in its own home territory. When there is a power asymmetry, the weaker group commonly enters into a client relationship with the stronger patron society, with accompanying ideological differentiation. If the h-g trade products and services are highly desired, the ags commonly use ideology to try and prevent the h-gs from adopting an ag way of life, though the ideology may have arisen for other cultural reasons (Galaty, 1979; Kassam, 1986; Smith, 1997b).

When the h-g/ag relationship is based on forest/bush product trade goods, the h-gs maintain a territory that contains resources unavailable in the ag territory. In this case mutualistic specialization is supported by resource partitioning. In most cases the ags occupy the better watered, deforested land where crops and livestock can be raised. Blackburn (1982: 283) proposes that the Okiek are a clear case of resource partitioning. If the source of the natural products - the forest/bush - is degraded to the extent that the trade relationship is no longer sustainable, the economic basis for the trade h-gs disappears, and the stage 4 of h-g laborers or stage 5 quickly ensues. There is therefore a link between environmental conservation and cultural survival. This holds even when the h-gs are trading with state or private enterprises (Stiles, 1994c). The mixed-race caboclos of Amazonia are an example of the recent creation of a stage 3, DR h-g type, in response to forest product trade opportunities involving resource partitioning (personal observation, 1990), demonstrating the contemporaneity of this mode of production.

HUNTER-GATHERERS AS ANOALOGUES OR MODELS

Except where direct historical continuity can be demonstrated between the archaeological remains and an existing society, everyone seems to be agreed that no one h-g group can be used as a specific analogy to explain unrelated archaeological material. One group can be used to invalidate a generalized hypothesis or model, however, as Yellen's (1977) ethnoarchaeological study of the Ju/'hoansi

did to Binford's (1967) model of base camp/task camp site differentiation, though Binford (1983: 138-141) subsequently used other h-g settlement pattern data to criticize Yellen's model and to refine his own. The possibilities and limitations of ethnoarchaeology are well understood and generally accepted. EE possibilities and limitations are not.

Lee (1979) has proposed that there are three areas that are appropriate for making general analogies between contemporary and prehistoric h-gs based on the uniformitarian principle: food, work and spatial organization. Generalizations, or laws, in these areas will remain constant because of necessary relationships between ecological variables and thermodynamic principles. Archaeological remains here are not being used, but rather the living h-gs are acting as living remains, or analogues, of the past. EE makes extensive use of this principle.

The main problem with this view, however, is that for most of the prehistoric past there were no stage 1-5 h-gs. We are usually using stage 2-5 h-gs as models for stage 0 h-gs. This might be comparable to using geological processes seen today on earth to reconstruct what produced geological phenomena on the moon. Certain principles will remain valid, but the context is so different how will the processes operate? Obviously stage 1 or 2 h-gs will be better analogues than stage 3 and above, which brings up the important point that readers assessing the work of other researchers need to know the context of the h-g group in question. If important conclusions about prehistoric human behavior are being proposed, is it Earth geological processes that are being used as the analogy for rocks on the moon?

It is ironic that the Harvard Kalahari Project has received so much criticism for representing the Dobe Ju/'hoansi as something they supposedly were not - reasonable analogues of stage 0 h-gs - because Lee and colleagues (1979; Lee & DeVore, 1976; Solway & Lee, 1990; Lee & Guenther, 1993) have gone to great lengths to present a detailed historical and ecological contextual picture of the Ju/'hoansi. Lee (1979: xvii & 2) has stated explicitly that living h-gs cannot be used as 'living fossils' or 'missing links' and that the effects of outside contacts on a h-g group must first be ascertained before conclusions with evolutionary significance can be drawn. There is good evidence that most San groups in Botswana have a long history of interactions with ags (Schrire, 1980; Wilmsen & Denbow, 1990), that is not disputed. What is disputed is the degree of interaction the Dobe Ju/'hoansi expressed with ags prior to and during the research period. The archaeological and ethnohistorical evidence of the Dobe area thus far seem to support Lee's view that ags were only recent arrivals to the area (Lee & Guenther, 1993; Smith, 1996; Sadr, 1997), and thus they would most likely fall into stage 2 as defined above, about as good an analogue that could be found in the 1960's. The voluminous published descriptions of them show that they were clearly not living the life of stage 3 or above h-gs (except for those engaged in mafisa).

The picture for another h-g group that has been the subject of a great number of publications, the Ache of Paraguay, is very different. Here we learn almost nothing about Ache history or social relations with outsiders. We are told simply that the Northern Ache were full-time h-gs until the 1970's (e.g. Hawkes et al., 1982; Hawkes et al., 1987; Hill & Hurtado, 1989). Extensive arguments are presented of

how today's foraging by the Ache is the same as precontact times, even though they live on a Catholic mission and grow crops. Today they 'continue to take extended foraging trips ..... into the surrounding forest, where they support themselves entirely by hunting and gathering in a manner they claim to be like their full-time foraging of a few years ago' (Hawkes, 1987: 350). 'The technology employed on foraging trips that we sampled was virtually identical to that used before contact...' and '...the hunting pressure is similar to that we calculated before contact. These factors combined lead us to believe that the rates of foraging returns that we measured.... must indeed be very close to the return rates the Ache experienced before contact.' (Hill et al., 1984: 115-116) and finally, 'Thus, in short, it appears to us that our sample is in fact representative of precontact full-time foraging behavior' (Hill et al., 1984: 117).

Several conclusions from this research contradict or question the findings of other h-g studies, and the Utah researchers claim that Ache behavior should be included in the range of variation of all h-g behavior, including prehistoric. However, conclusions about h-g behavior in the past based on the Ache today depend on how well they act as analogues to past h-g behavior. Food acquisition, distribution and consumption patterns in relation to time devoted to alternative activities are the main variables that determine the conclusions. The degree of similarity in ecological, technological and social context are fundamental to evaluating the degree of similarity between the Ache today and precontact Ache, hence the stress paid by the Utah team to describing Ache foraging today as precontact in nature.

If the publications are read closely, however, we find that on the foraging trips, 'Most women began these trips with several kilos of manioc or corn, and someone always brought sugar and salt' (Hawkes et al., 1982: 384), '.in 1980 a few Ache hunters acquired shotguns, which raised their overall return rate from 910 cal/h (with bow and arrow) to 2,360 cal/h' (Hill & Hurtado, 1989: 439), that '...much of the area has been cut for agriculture and cattle pasture...' which has resulted in considerably lower animal biomass and species diversity in the Ache forest than in other South American forests (Hill & Hurtado, 1989: 438), that the Ache bought food and other goods from mission and outside stores, partly with money earned from the manufacture and sale of crafts (Hawkes et al., 1987: 139), and that children are often left behind at the mission on foraging trips (Hawkes et al., 1987: 155). These are just a few of the inconsistencies found.

The extensive tables of time allocation show no time for collecting the forest materials necessary for crafts' manufacture, no mention is made of trade in forest products (which would make the Ache unique in the h-g world), zero time is spent in contact with outside groups (again unique), the effect of the use of shotguns, iron implements and utensils, matches, and so on co-exists with precontact technology claims, mission foods on foraging trips and the degraded ecosystem do not influence conclusions of optimal foraging behavior and lack of seasonal effects on nutrition, the underrepresentation of children on foraging trips is not thought to affect per capita daily calorie consumption figures, and so on. Clearly there is a problem in accepting the Northern Ache living on the Chupa Pou Catholic Mission as living analogues of stage 0 h-gs, and thus there is a credibility problem with the conclusions of the research.

Researchers need to be honest and open about the contextual situation of the groups they work with and to present a reasonably detailed account of their history of interactions with outside peoples. The more similar this context is to the subject of analogy, the better the analogy will be. Since all historically observed h-gs have been modern Homo sapiens, making analogies from them to premodern humans becomes very problematical (Foley, 1988), though not impossible.

DISCUSSION

1. *Why study H-Gs?*

H-gs can be studied for any of the three main paradigm objectives defined above: (1) traditional social science, (2) as analogues or models, or (3) to understand the contemporary situation of h-gs, often in order to provide assistance, and sometimes to make an ideological point. But the historical, ecological and social context of the h-g group in question is highly relevant and should be included in any type of study.

2. *What explains IR and DR systems?*

Stage 0 h-gs practice an IR or DR system depending on the ecology they live in for the reasons given above. The most important explanatory variables are seasonality in resource abundance/scarcity, the spatial and temporal distribution of these resources, and the predictability of obtaining food on any given day. Settlement patterns, the use of facilities, and storage practices are intervening variables that influence the character of egalitarian ethics, social arrangements, leadership roles, sharing systems, and so on.

Following contact with ag peoples, socio-economic factors involving h-g/ag interactions can affect the IR/DR variables in varying ways, irrespective of the ecological and technological variables. For example, the Aweer in 1800 A.D. were probably stage 4 h-gs who were IR because they were clients of Oromo-speaking pastoralists. As such they were not allowed to own livestock for ideological reasons, which supported the socio-economic motivation of the pastoralists to use the Aweer as suppliers of ivory and other trade goods, and to make use of their services (Stiles, 1981). The Aweer transformed to DR, 3 h-gs after the Oromo-speakers migrated, because now they simply traded to stay on good terms with neighbors and to obtain desired outside goods, but they were institutionalized clients of no one.

Much research is needed from the perspective of stages of contact and their effects on the various IR and DR variables in order to explain patterns of socio-economic variation in h-gs.

3. *Can living H-Gs be used as analogies?*

Living h-g groups need to be chosen carefully depending on the research objectives. Arctic h-gs practicing a stage 4, DR system would be poor models for investigating sharing behavior of early hominids in Africa, but sub-Arctic stage 2, DR h-gs might be fairly reasonable analogues for the settlement and subsistence patterns of northern European Late Pleistocene humans. Any researchers using h-gs of tropical forest ecosystems must be particularly cautious in employing them to model any prehistoric humans more than about 5000 years old, given the probability that h-gs did not live in deep forest prior to local agriculture (Hart & Hart, 1986; Headland, 1987; Sponsel, 1986). Basically, the more the temporal, geographical, ecological and cultural features of the contemporary and prehistoric h-gs are similar, the better the analogy will be (Stiles, 1977).

Studies involving EE paradigm objectives, in which today's h-gs are assumed to validly represent prehistoric h-gs, are in most cases unacceptable. I would argue that any group above stage 2 would be too modified by outside influences to allow confidence to be put into any conclusions concerning their behavior either supporting or refuting optimal foraging theory predictions.

4. *Why do H-Gs persist?*

H-gs persist because they serve a purpose. Mutualistic specialization and resource partitioning explain the purpose, which generally involves h-gs providing more powerful neighbors with desired goods and services. Arctic h-gs are a special case, however, too complicated to deal properly with here.

CONCLUSIONS

H-g studies will continue, but it is likely that the EE paradigm type involving optimal foraging theory will quietly die out, due the increasingly apparent inappropriateness of contemporary h-gs for this purpose. Testing EE hypotheses can best be approached through archaeology and the early ethnographic record of stage 1-2 h-gs, though these are unfortunately limited. Ethnographic descriptions and historical reconstruction of h-g societies are urgently needed, however, as more of these groups continue to evolve towards stage 5 Assimilation/Annihilation. Studies involving h-g socio-economic transformations, culture change, and adaptations to contemporary political and economic contexts will also continue, with increasing attention being paid to human rights and environmental issues.

An area of particular interest involves investigating when and where the earliest DR h-g systems originated. The first transformations from IR to DR laid the socio-economic foundation for the origins of domestication and subsequent development of complex societies.

NOTES

(1) Since documented contact and change with so many h-g groups involved European descent peoples, they will be included in 'ags.'

(2) It is when h-gs and herders are in association during this stage that confusion often arises for researchers as to the ethnic identity of h-gs. The relationship of the Maasai-Dorobo in East Africa (Bernsten, 1976; van Zwanenburg, 1976; Galaty, 1979; Kratz, 1979; Stiles, 1993b) and Khoekhoe-Soaqua in South Africa (Schrire, 1980; 1992; Parkington, 1984; Smith et al., 1991; Yates & Smith, 1993) have inspired identical debates. One side holds that foraging and herding are simply occupations that individuals can switch back and forth to, depending on circumstances, and that the h-gs and herders are one community. The other view recognizes that there are cultural and ideological differences between the communities who normally practice one or the other modes of production, but that there is nevertheless some crossover.

(3) A similar series of propositions could be constructed that attempt to explain IR and DR based on poor versus rich resource habitats respectively. The problem here is answering the question of why food storage would originate in the absence of seasonal scarcity. Social competition has been proposed as an answer (Hayden, 1990), but how and why did this competition begin only since the very late Pleistocene? Unless this question can be answered, seasonality of ecosystems seems the better model.

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Author's Name and Address: Daniel STILES, *P. O. Box 5159 Diani Beach, Kenya. E-Mail:Kenyadan@AfricaOnline.co.ke*